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ABSTRACT

This study examines 1) the effects of teacher contingent and non-contingent (random) praise and/or attention on the classroom behavior of economically disadvantaged adolescents and 2) the effects of contingent praise on the non-target members of the classroom, and explores the length of time necessary to demonstrate significant changes in behavior. The subjects were 150 eighth-grade high school students in Knoxville, Tennessee, and six teachers with several years experience. Three behavioral categories were established: appropriate, relevant, and inappropriate. Six graduate students served as observers and for each class three target and three non-target students were observed daily. The results show that contingent teacher praise and/or attention was effective in controlling behavior. Teacher praise or attention to relevant behavior in combination with ignoring disruptive behaviors increased relevant behavior and concomitantly reduced inappropriate behaviors. Non-contingent praise increased the percentage of relevant behavior for target subjects but not to the extent of contingent praise. A closer examination of the data reveals that there were individual subject differences, and generalizations about the rapidity or amount of changes in classroom behavior occurring within a specified time period are tenuous. The implication of the study is that a teacher can modify and influence the behavior of his students if he can control his own behavior. (Author/MBM)

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THE APPLICATION OF SOCIAL REINFORCEMENT IN SIX JUNIOR HIGH SCHOOL CLASSROOMS

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THE APPLICATION OF SOCIAL REINFORCEMENT IN SIX JUNIOR HIGH SCHOOL CLASSROOMS[1]

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The effective use of contingent social reinforcement in the modification of children's behavior in elementary school classrooms has been demonstrated in a number of studies (Becker, Madsen, Arnold, and Thomas, 1967; Hall, Lund, and Jackson, 1968; Madsen, Becker, and Thomas, 1968; and Sibley, Abbott, and Cooper, 1969). However, no research has systematically examined these procedures in the secondary school classroom. In fact, most investigations that have used the principles of reinforcement to modify adolescent behavior have used tokens or money to change behavior. Also, these studies have been conducted either in predominately institutionalized settings or with rather specialized populations (Burchard and Tyler, 1965; Staats, Minke, Goodwin, and Landeen, 1967; Clark, Lachowicz, and Wolf, 1968; and Phillips, 1968).

Classroom investigations that have applied teacher contingent approval or praise have chosen one or two target children to receive praise. Two investigators have reported that their teachers noticed a change in the non-target pupils (other members of the class) as well as the classroom atmosphere in terms of general improvement in overall behavior (Hall et al., 1968; and Madsen et al., 1968). No corroborative data were collected to verify these reports. The degree to which contingent teachers praise might generalize to non-target pupils warrants investigation.

The few studies that have used non-contingent reinforcement in the natural setting have not been effective in altering (increasing) the desired

behavior (Bushell, Wrobel, and Michaelis, 1968; Hart, Reynolds, Baer, Brawley, and Harris, 1968; and Redd, 1969). However, there may be evidence to suggest that non-contingent (random) social reinforcement may increase the appropriate behavior of lower class adolescents. Cormier (1969) found that teachers very infrequently praise lower class adolescents for appropriate classroom behavior. It may be that the withholding and presentation of approval alter the motivation for obtaining approval (Eisenberger, 1970). More direct evidence of the effects of non-contingent praise appeared in a recent study (McAllister, Stachowiak, Baer, and Conderman, 1969). The authors assessed the effects of teacher praise, and disapproval to two target behaviors (inappropriate talking and turning around) on high school English class of 25 students. Although teacher praise was after a time period in which no inappropriate talking occurred, she praised the entire class. Eighty percent of the students in the class were from lower-class families.

The purpose of this study was to examine the effects of teacher contingent and non-contingent (random) praise and/or attention on the classroom behavior of economically disadvantaged adolescents. Other purposes were to ascertain the effects of contingent praise on the non-target members of the classroom, and to explore the length of time (days) necessary to demonstrate significant changes in behavior.

METHOD

Subjects

Setting. The subjects were 150 eighth-grade students enrolled in a junior-senior high school in Knoxville, Tennessee. Over 50 percent of the students in the school came from families with an annual income of less than $3,000. One male and five female teachers volunteered and were paid to participate in the study. All teachers had several years of teaching experience. One class period for each teacher was selected for observation. Each teacher chose his most disruptive class. The eighth-grade subjects taught during these class periods were three English, two mathematics, and one health. All class periods were in the morning with the exception of one afternoon methematics class. The study was conducted during the second semester. All students had the same teacher for the first semester.

Target and Non-Target Students. Each teacher identified three target students in his class as being either disruptive or not motivated to do the assigned work. The three target students and three other members of the class (non-target) were observed daily.

Procedure

Behavioral Categories. After several weeks of observing and recording the most common student behavior for each class, the behaviors were grouped into categories on the basis of similarity. The following three categories of student behavior were rated. Appropriate behaviors consisted of answering questions orally which are lesson oriented, writing assignments or answers to questions when directed to do so by the teacher, reading a book or head oriented toward the book, hand raised in order to get the teacher's attention during a lesson, and following the teacher's instructions. Relevant behaviors were rated only if it did not fit one of the above examples of appropriate behavior. For example, if the student appeared to be oriented or attending to classroom activities, the student was rated in this category. Inappropriate behaviors rated were gestures without talking, getting out of seat, walking around, disruptive movements, making disruptive noise with objects, talking or attending to another student during a lesson, blurting out answers without being called on, singing, whistling, laughing, sleeping, and ignoring the teacher's request or questions or doing something different from that which the student or class was directed to do.

Observer Training and Reliability. Six graduate students served as observers. Observer training consisted of a gradual introduction of videotaped illustrations of each behavioral category until each observer became familiar with all of the categories. Also, pairs of observers would rate

the classroom behavior of the same student for three to six minutes and then compare their ratings and discuss differences. Reliability checks were made weekly throughout the study. The observers rated student behavior in ten-second time intervals from a video monitor displaying taped classroom sessions. Observers rated these video-taped sessions independently and from these weekly ratings inter-observer reliability was computed. The average reliability between all combinations of observers was expressed in pi-coefficients (Scott, 1955), .90, with a range of .78 to .97. Classroom reliabilities were also obtained for pairs of observers during the initial phases of the study and the average pi-coefficient was .92 with a range of .78 to .98.

Observation and Rating. For each class three target and three non-target students were observed daily. Except for the target students all members of each class were numbered. A table of random numbers was used daily to select the three non-target students to be observed for each class. Only one behavioral category was rated during a 10 second time interval. If examples of all three categories of behavior occurred during a 10 second interval, observers were instructed to rate according to the following priority: (1) inappropriate, (2) relevant, and (3) appropriate. For example, if a student was writing an assignment (appropriate) and whistling (inappropriate) during a 10 second interval, the observers rated the inappropriate category. Each student (three target and three non-target) was observed daily for a total of 6 minutes. The daily order in which each student was observed was random. Observers rated student behavior on observation sheets which were divided into blocks of 10 second time intervals. Solid-state, cartridge, tape recorders were used as timing devices for each observer. Ten second intervals were recorded and the time sequences announced to the observer the exact intervals. Each recorder had a Y-connector from which two ear plugs were connected. One ear plug had a 3 feet extension and the other a 12 feet. The Y-connector facilitated independent observation for reliability checks using the same tape recorder. The tape recorder eliminated the need for the observer to visually monitor a watch which might distract him from observing and rating.

There was one observer for each class except during times when reliability checks were made. The observers were instructed to sit in back of the classroom in a way to maximize their observational range and without disrupting any normal classroom activity. Also, observers were instructed to avoid all eye contact and interaction with the students and teacher. All observers were in the classroom at least two weeks before the collection of baseline data. Observers were not informed about the sequence of the experimental conditions.

Teacher Training. At the end of the baseline period the teachers read a programmed book on the principles of social reinforcement which provided them with the rationale for the procedures introduced in their classes (Patterson and Gullion, 1968). If the teacher started the experimental sequence with a control period, this book and the instructions were not presented until the completion of the period. The following instructions were given individually to each teacher.

Contingent Praise and/or Attention (after Madsen et al., 1968)

This phase of the study is designed to increase classroom participation or relevant behaviors through praise and other forms of approval. We are inclined to take relevant classroom behavior for granted and pay attention only to disruptive classroom behaviors. During this phase of our research we would like for you to try something different. The technique that you will use is characterized as "catching the student participating in appropriate classroom behavior" and making a positive comment to the target student. The positive comment or praise is designed to reward the target student for relevant behavior. Give praise, attention, or smile when a target student is doing what is expected during the class period. Specifically, give student praise when the target adolescent responds (1) verbally to your questions, directed to him or to the class in general, or to an appropriate classroom recitation, (2) to hand raising in order to recite, (3) to written classroom assignments, and (4) to assigned classroom reading. Start "small" by giving praise and attention at the first signs of appropriate behavior. Watch carefully and when the adolescent participates in terms of any of the four above kinds of behavior, make such comments as "You're doing a fine job, (name)," or "That's good." It is very important during the first few days to catch as many participating behaviors as possible. Even for example if an adolescent has thrown an eraser at you (one minute ago) and is now working or appropriately responding, you should praise the participating behavior. We are assuming that your commendation and praise are important to the student. This is generally the case, but sometimes it takes a while for praise to become effective. Persistence in catching adolescents participating in classroom activity and delivering praise and attention should eventually increase relevant behavior of the target student.

Examples of praise comments are as follows:
I like the way you're doing your work, (name).
That's a very good (paper, answer, report, job), (name).
You're doing fine.
That's very good (if he or she generally gets only a few answers correct).
That makes me feel good.

In general, give praise for achievement. Specifically, you can praise for working individually (writing or reading), raising hand when appropriate, responding to questions, paying attention to directions and following through. Try to use variety and expression in your comments. Stay away from sarcasm. Attempt to become spontaneous in your praise and smile when delivering praise. At first you will probably get the feeling that your praising a great deal and it sounds a little phony to you. This is typical reaction and it becomes more natural with the passage of time. If comments sometimes might interfere with the ongoing class activities then use facial attention and smiles. Walk around the room during study time. Praise quietly spoken to a student has been found effective in combination with some physical sign of approval. Praise should be given

individually to each target student when you catch them participating, and remember to ignore inappropriate behavior.

Non-Contingent Praise

During this phase of the study you should give non-contingent praise to the entire class. Praise should be presented according to random intervals of time during the class period. Also, praise should be given without regard for what student behavior might be occurring at those times. During the contingent delivery of praise we asked you to give praise when you "caught" a target student participating in any one of the appropriate behaviors. The praise was contingent on the student's behavior. Praise during this phase of the study is without regard to what behavior occurred immediately before you deliver it. Attempt to give praise ten times a class period. Try to spread your comments over the period. Remember to give praise to the entire class and to ignore inappropriate behavior.

Ignoring Inappropriate Behavior (Madsen et al., 1968)

During this phase of the study you should learn to ignore (do not attend to) behaviors which interfere with learning or teaching, unless a student is being hurt by another, in which case use a punishment which seems appropriate. Learning to ignore is rather difficult. Most of us pay attention to the violations. For example, instead of ignoring we often say such things as: "John, you know you are supposed to be working;" "Gary, will you stop bothering your neighbors;" "Bert, will you or can you keep your hands off Bob;" "Mariana, stop running around and do your work;" "Hank, will you please stop rocking on your chair."

Behaviors which are to be ignored include motor behaviors such as getting out of seat, standing up, walking around the room, moving chairs, or sitting in a contorted manner. Any verbal comment or noise not connected with the assignments should also be ignored, such as: carrying on conversations with other members of the class when it is not permitted, answering questions without raising hands or being called on, making remarks when no questions have been asked, calling your name to get attention, and extraneous noises such as whistling, laughing loudly, blowing nose, or coughing. An additional important group of behaviors to be ignored are those which the student engages in when he is supposed to be doing other things, for example, when the student ignores your instructions you are to ignore him. Any noises made with objects, playing with pencils or other materials should be ignored, as well as, taking things from or disturbing another student by turning around and touching or grabbing him.

The reason for this phase of the study is to test the possibility that attention to inappropriate behavior may serve to strengthen the very behavior that the attention is intended to diminish. Inappropriate behavior may be strengthened by paying attention to it even though you may think that you are punishing or decreasing the behavior.

Ignoring inappropriate student behavior should be followed during the phases in which you will deliver contingent and non-contingent praise.

After the instructions were read, the E answered any questions and discussed along with each teacher the relationship of the instructions to the principles of social reinforcement. One E instructed all teachers individually by using role playing techniques with each teacher to demonstrate ignoring inappropriate behavior, contingent praise, and non-contingent praise. All teachers were instructed about the confidential nature of the research. Teachers were also requested not to discuss with any other teacher what was occurring in his classroom.

Experimental Design

Each teacher began the study with an eight-day baseline phase in which observers rated the classroom behavior of target and non-target students. After the baseline phase, one of the following six conditions occurred: control short (CS), control long (CL), non-contingent short (NCS), non-contingent long (NCL), contingent short (CTS), and contingent long (CTL). The short periods were four school days and the long periods lasted eight days. During the control conditions the teachers were instructed to reinstate the baseline conditions (i.e., attend to inappropriate behavior and infrequent attention to appropriate behavior). Teachers were instructed to ignore inappropriate behavior under contingent and non-contingent conditions. The Es monitored the teacher's behavior for each experimental condition. Es consulted with each teacher individually, almost daily, about any problems that occurred in executing the particular experimental condition. The assignment of teachers and the sequence of the six experimental conditions were random.

RESULTS

To facilitate the analyses between short and long time periods of the experimental and control conditions, ratio scores (RS) were computed for target and non-target students. RS = BE/PT X 100, where BE = the number of behaviors emitted during an experimental or control condition, and baseline, and PT = the possible total number of occasions for observation. Percentages of increase or decrease were selected as dependent variables to indicate the magnitude of emitted behaviors during the experimental conditions. The emitted behavior score (EBS) represented a percentage increase or decrease in the ratio of emitted behaviors during an experimental or a control condition when compared to baseline behaviors. EBS = RS $- RS_1$, where RS_2 = the ratio of behavior (appropriate, relevant, inappropriate) emitted by a student during an experimental or a control condition, and RS_1 = the ratio of behaviors emitted during baseline. Computation of EBSs had the effect of equating baseline performance to zero.

Target Students. In Table 1 are presented the analyses of variance for appropriate, relevant, and inappropriate EBSs for target students.

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Insert Table 1 about here

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The experimental and control conditions were significant for appropriate ($F = 12.76$, $p < .01$) and inappropriate EBSs ($F = 22.35$, $p < .01$). In Figure 1 are shown appropriate, relevant, and inappropriate EBS means of target and non-target students as a function of the six experimental conditions. A

post hoc analysis of these means reveals that under CTS, CTL, NCL, and NCS conditions increases in appropriate and decreases in inappropriate behavior were greater ($p < .01$) than during CS and CL conditions. Also, no significant effect attributable to CT (L or S) and NC condition differences were revealed for either appropriate or inappropriate behavior. As indicated in Figure 1, the magnitude of appropriate and inappropriate behavior was slightly greater ($p < .10$) for CTL condition than during NCL. The analysis of variance indicated a significant effect of the time periods for relevant behavior ($p < .05$) ($F = 12.82$, $p < .05$). A significant contrast of the means for relevant behavior indicated greater mean differences for long periods than for short time periods.

Analysis of experimental condition means x teacher indicated that no significance occurred between the CTL, CTS, NCL, NCS and the control conditions for appropriate and relevant behaviors for one teacher. Further analysis revealed a significant experimental condition-period interaction for appropriate behavior. Differences were found between long and short periods for three teachers (CT > CTS and CTL > NCS, $p < .05$). No significant differences were indicated between the short and long periods for the other three teachers.

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Insert Figure 1 about here

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Non-Target Students. In Table 2 are presented the analyses of variance for appropriate, relevant, and inappropriate behaviors for non-target students. The experimental conditions were found significant for appropriate ($F = 5.51$, $p < .05$) and inappropriate behaviors ($F = 7.99$, $p < .01$).

Following through with post hoc comparisons significant differences were found between CTL, CTS, NCL, NCS and the long and short control conditions for appropriate behavior ($p < .05$), and inappropriate behavior ($p < .01$). No significant differences were found between the experimental conditions for relevant behavior. Differences between long and short time periods were not significant for all categories of behavior.

The magnitude of increases in appropriate and decreases in inappropriate behavior between target and non-target students were significant during the CTL and CTS conditions ($p < .01$).

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Insert Table 2 about here

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DISCUSSION

The results showed that contingent teacher praise and/or attention was effective in controlling the classroom behavior of target adolescents. Teacher praise or attention to relevant behavior in combination with ignoring disruptive behaviors increased relevant behaviors and concomitantly reduced inappropriate behaviors. These data corrobate results of studies using similar procedures in elementary school settings (Hall et al., 1968; Thomas et al., 1968; Madsen et al., 1968; and Sibley et al., 1969). Also the percentage of relevant and inappropriate behaviors varied systematically for each experimental condition.

Contingent teacher praise or attention administered to target Ss generalized significantly to non-target adolescents. The increases in relevant behaviors and reduction in inappropriate behaviors that occurred for target Ss was also observed for non-target Ss. The results of this investigation support reports of other studies that changes occur in the non-target pupils as a result of praising one or two target children contingently (Hall et al., 1968; Madsen et al., 1968). Also the data of this study support the hypothesis presented by Kanfer (1965) that vicarious reinforcement provides considerable learning experience in a classroom in which students observe the behavior and reinforcement of others. These results suggest also that target students might be models for non-target students. The behavior of models possibly functions as discriminative stimuli in facilitating the expression by others of similar behaviors.

Non-contingent praise increased the percentage of relevant behavior for target Ss but not to the extent of contingent praise and attention. The same effects also existed for decreases of inappropriate behavior. The results of this experimental condition for target students are contrary to other studies using non-contingent reinforcement to alter desired behavior (Bushell et al., 1968; and Hart et al., 1968). There are possibly two explanations for non-contingent praise increasing the frequency of relevant behavior of target students. One possibility might be that the teacher and his class have become associated with the positive social stimuli (praise). The frequent (approximately 10 to 14 per observational period in this study) pairing of praise with a "neutral or negative" attitude about the class setting and/or teacher might eventually elicit a positive attitude from the students about the class and/or teacher. Staats and Staats (1958) have demonstrated the formation of attitudes to verbal stimuli through classical conditioning. It is very difficult to ascertain from this investigation whether or not the results of non-contingent praise were a result of a classical conditioning paradigm.

As previously presented another explanation might be the teacher's potential for acquiring positive discriminative cue properties. The process by which this occurs depends largely on the previous school experience that a student might have in receiving praise or attention from a teacher. If a student has received some positive social stimuli for some relevant classroom behavior, it is probably that a teacher could acquire positive discriminating cue properties under conditions in which praise and attention were administered non-contingently. During the baseline conditions of this investigation most teachers administered some praise or individual attention.

It is difficult to assess whether or not deprivation of social approval altered the motivation for obtaining approval during the non-contingent conditions. If teachers acquire positive discriminative cue properties, then it is not unreasonable to expect that the students were deprived of social approval for appropriate classroom behavior. Most teachers did administer some praise during baseline of this study. However, teacher disapproval and attention to inappropriate behavior occurred more frequently than praise (9:1). Possibly the other experimental conditions have confounded the effects of non-contingent praise.

Although the results of the non-contingent praise conditions were correlated with significant increases of relevant behaviors of non-target students, the results were less dramatic than for target students. A possible cause for this effect might be that the average percentage of inappropriate behavior was greater for target students than for non-target students during the baseline conditions. In other classroom studies the degree of percentage decrease of inappropriate and increase of relevant behavior has been attributed to the relatively high or low percentage of inappropriate behavior that occurred during baseline (O'Leary and Becker, 1967; and Cormier, 1969). These investigators suggest that the percentage of increase or decrease during treatment is directly related to the percentage of inappropriate or disruptive behavior that occurred during baseline.

The sequence in which the long and short control conditions occurred was different for each teacher. It is difficult to account for the systematic increases in inappropriate and decreases in appropriate behavior during the CL and CS conditions as random fluctuations. Perhaps the above baseline EBSs

during CL and CS is a consequence, for some teachers, of the preceding contingent conditions.

The results between the long and short time periods during the experimental conditions of target students occurred for appropriate behavior. No significant differences between time periods were found for non-target students. These data support the results of research using adolescent subjects in which rapid and stable changes were reported using tokens as reinforcers (Phillips, 1968). A closer examination of the data of this study reveals that there were individual subject differences. Generalizations about the rapidity or amount of changes in classroom behavior occurring within a specified time period are tenuous. The implication of this study is that a teacher can modify and influence the behavior of his students if he can control his own behavior.

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FOOTNOTES

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TABLE 1

Analyses of Variance of Appropriate, Relevant, and Inappropriate Emitted Behavior Scores for Target Students

Source	df	APPROPRIATE MS	APPROPRIATE F	RELEVANT MS	RELEVANT F	INAPPROPRIATE MS	INAPPROPRIATE F
Between Ss:	17						
Teacher (T)	5	105.48	.14	782.89	2.02	1154.95	.86
Students (S)	12	767.15		386.99		1340.28	
Within Ss:	90						
Time Period (P)	1	363.00	5.24	746.81	12.82*	40.33	.11
Experimental Conditions (C)	2	8703.40	12.76**	66.69	.17	10296.45	22.35**
T X P	5	69.31	.67	58.24	.79	36.91	1.96
T X C	10	681.99	4.39**	393.95	3.48**	461.71	2.09
P X C	2	735.19	1.95	1.56	.02	496.03	2.07
S X P	12	103.44		73.75		184.76	
S X C	24	153.48		113.27		220.09	
T X P X C	10	377.44	2.37*	80.55	.79	239.37	1.86
Error	24	159.18		101.14		128.55	

*$p < .05$.

**$p < .01$.

TABLE 2

Analyses of Variance of Appropriate, Relevant, and Inappropriate Emitted Behavior Scores for Non-Target Students

Source	df	APPROPRIATE MS	APPROPRIATE F	RELEVANT MS	RELEVANT F	INAPPROPRIATE MS	INAPPROPRIATE F
Experimental Conditions (C)	2	781.86	5.51*	11.58	.12	934.11	7.99**
Time Periods (P)	1	427.11	6.02	225.00	4.74	64.00	.38
Subjects (S)	5	1366.51		1026.67		1339.58	
C X P	2	31.03	.23	5.08	.15	34.33	.19
C X S	10	141.79		98.55		116.84	
P X S	5	70.91		47.47		167.73	
Error	10	136.63		34.25		176.07	

*$p < .05$.

**$p < .01$.

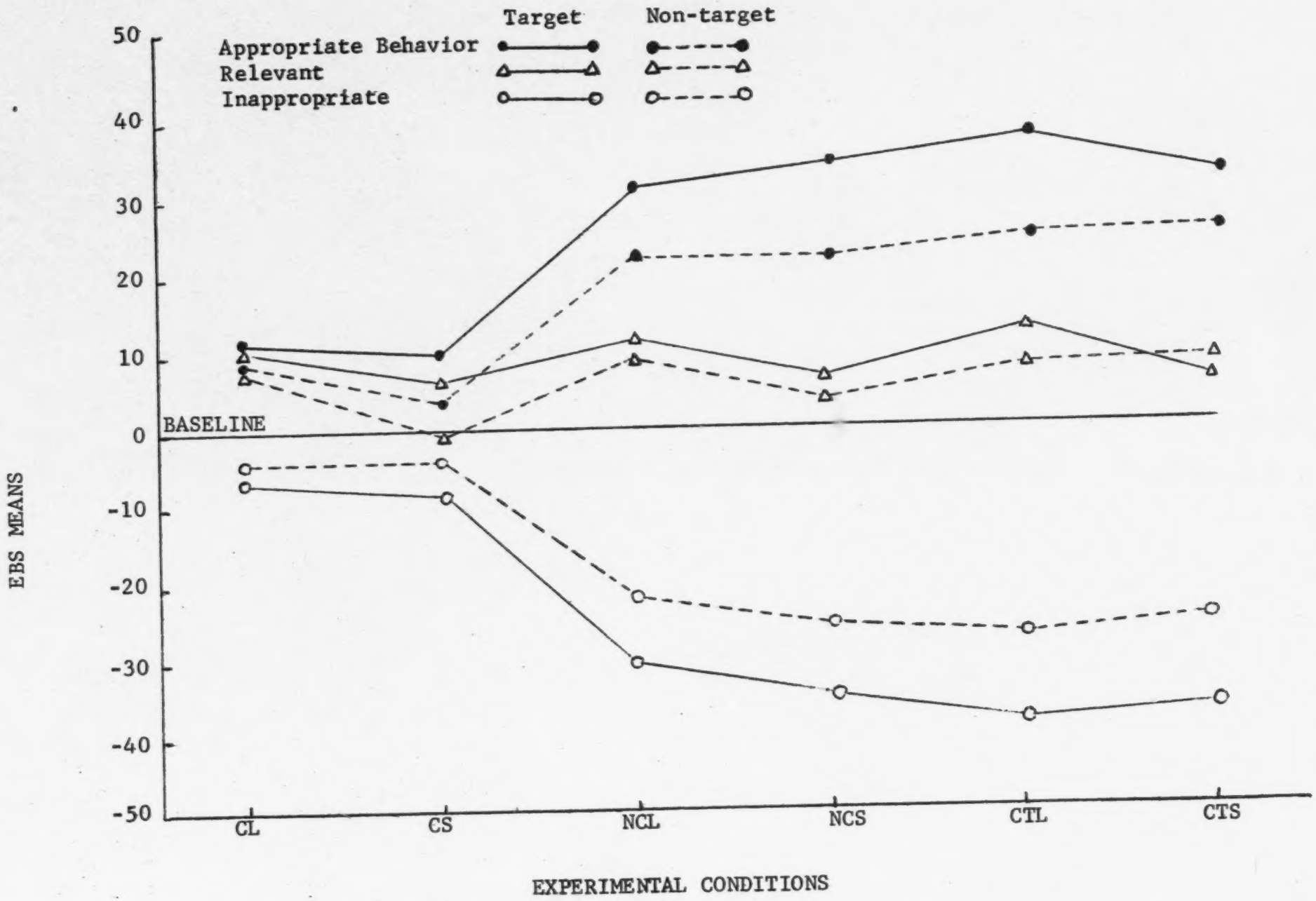

Figure 1. Relevant, inappropriate, and appropriate EBS means of target and non-target Ss as a function of the six experimental conditions.